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| 10/731,476 | 12/10/2003 | Ichiro Kataoka | 03500.017766 | 5423 |
| 5514 7590 11/04/2009 FITZPATRICK CELLA HARPER & SCINTO 1290 Avenue of the Americas NEW YORK, NY 10104-3800 | | | | |
| EXAMINER | | | | |
| BARTON, JEFFREY THOMAS | | | | |
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| 1795 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/731,476

Applicant(s)

KATAOKA ET AL.

Examiner

Jeffrey T. Barton

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4 September 2009 has been entered.

Response to Amendment

2. The amendment filed on 4 September 2009 does not place the application in condition for allowance.

Status of Rejections Pending Since the Office Action of 7 May 2009

3. All rejections are maintained.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al (US 6,369,316) in view of Chikaki et al. (6,149,757)

Plessing discloses a photovoltaic module and method of producing the same. The module is shown in figure 1 with the method in figure 2.

Regarding claim 1, Plessing shows the method of producing in figure 2. The method comprises the steps of mounting the body to be laminated, 1, on a tabular member, 15; carrying the body to be laminated along with the tabular member onto the mounting board, 21 (belt 16 does the carrying); heat-bonding the body to be laminated

by pressing using a vacuum laminator, 17; carrying out the body to be laminated along with the tabular member from the mounting board after moving the body to be laminated from the vacuum laminator (16 carries out); and separating the body to be laminated from the tabular member (separation section 27, see column 6, lines 45-50).

Regarding claims 2 and 3, Plessing discloses the use of release sheets, or separating films between the module and the tabular member (column 6, lines 15-18). It is the position of the examiner that the separating films and tabular member do not have perfectly flat surfaces down to the atomic level and thus the surfaces have some measure of irregularity or an irregular form on the surfaces as required in the claims. As applicant has not defined the specificities of these irregular forms, the reference is deemed meet the claim limitations.

Plessing does not explicitly disclose the instant cooling means that directly cool the diaphragm, nor does Plessing explicitly disclose the vacuum laminator comprising a diaphragm. Regarding claim 4, Plessing does not specifically require a specific mounting board temperature.

Chikaki teaches a conventional vacuum laminator as shown in figure 1. The apparatus uses a diaphragm 4 to press the body to be laminated.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the laminator configuration of Chikaki within the method of Plessing because Chikaki teaches the advantage of this laminator in avoiding air bubble in the laminated product and in allowing lamination of materials of different thickness, which would have been recognized by one skilled in the art as advantageous.

Regarding the limitations "wherein the diaphragm is directly cooled by cooling means after carrying out the body" and "wherein another body to be laminated is carried in along with a tabular member made of a metal plate onto the mounting board after cooling the diaphragm", these limitations are deemed to be obvious within the method taught by the combined art because it would have been obvious to carry out the lamination procedure of Plessing repeatedly to form numerous laminated modules. This is suggested by Plessing in that the carrier plates are sent back to the loading station after the completion of the lamination of a module stack. (Column 6, lines 46-48) The only reason for doing this is to repeat the procedure in order to produce multiple laminated module stacks. Clearly, Plessing intends that numerous modules will be made in the lamination system disclosed. (Plural modules disclosed also at Column 7, lines 24-26)

Applicant's specification teaches an "air blow" as exemplary cooling means. (Page 13, lines 14-17) It is the Examiner's position that the ventilation flow of air that returns the vacuum lamination apparatus to ambient pressure after lamination in the method of Plessing et al and Chikaki et al will obviously be at or near room temperature, and will therefore have a cooling effect on the membrane that had been in contact with the heated laminated body until the ventilation took place, and will therefore read on the instant cooling means. Again, since it would have been obvious to perform numerous sequential laminations in the combined methods as described above, such cooling will obviously take place after one or several bodies have been carried out and further bodies to be laminated will be carried in subsequently, as required in the claim.

Regarding claim 4, the choice of specific lamination temperature is dependent on the specific application i.e. the specific lamination system, the item to laminated, and optimization of the lamination process. It would be obvious to one skilled in the art to make such a determination of operating temperature based on the specific application/optimization. Absent any unexpected results, the choice of the specific temperature as within the claim would be obvious for the method taught by the prior art.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al and Chikaki et al as applied to claims 1-4 above, and further in view of Yamada et al (U.S. 6,127,622).

Plessing et al and Chikaki et al are relied upon for the reasons given above in addressing claims 1-4.

Neither Plessing et al nor Chikaki et al require a specific organic peroxide crosslinking agent.

Yamada teaches a laminated solar cell module as shown in figure 5. Yamada teaches the use of an encapsulating foam made of EVA for example (column 7, paragraph 4) and a crosslinking agent for the encapsulating foam made of an organic peroxide that has a 1-hour half-life temperature of between 100 and 170 °C (column 8, last paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the crosslinking agent of Yamada within the method of Plessing et al and Chikaki et al, because the crosslinking agent improves the heat

resistance and bond strength of the photovoltaic module (Yamada column 8, paragraph 7). It would have been further obvious to one of ordinary skill in the art at the time the invention was made to choose the specific half-life temperature of the claim because Yamada teaches that the crosslinking agent can have a 1-hour half-life temperature range that includes the claimed range. Absent any unexpected results, the selection of this portion of the range would be obvious for the combination. Because Yamada, Plessing et al, and Chikaki et al are concerned with solar cell modules, one would have a reasonable expectation of success from the combination. Thus the combination meets the claim.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al and Chikaki et al as applied to claims 1-4 above, and further in view of Taylor. (US 4,426,633)

Plessing et al and Chikaki et al are relied upon for the reasons given above in addressing claims 1-4.

Neither Plessing et al nor Chikaki et al explicitly teaches a material used for the separating films used to prevent adhesion of the laminated module to the carrier plate.

Taylor is relied upon for teaching known release films used in lamination methods to prevent adhesion of the laminated product to the lamination apparatus. Taylor teaches the use of glass-fiber reinforced PTFE as a release sheet in a lamination process. (Column 6, lines 8-45)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Plessing et al and Chikaki et al by specifically selecting glass fiber/PTFE release sheets as the separating films (Plessing, Column 6, lines 15-17), as taught by Taylor, because Taylor teaches that glass fiber/PTFE sheets are effective in preventing adhesion of the laminated products to the apparatus. (Column 6, lines 8-45) Because Taylor, Chikaki et al, and Plessing et al are all concerned with laminating systems and methods, a skilled artisan would have had a reasonable expectation of success from this combination. Furthermore, Plessing's silence concerning the material used to make the separating films would have led a skilled artisan to turn to related prior art release films, such as those of Taylor, to select an appropriate material. Note also that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

10. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al (US 6,369,316) in view of Ogawa. (US 6,041,840)

Plessing discloses a photovoltaic module and method of producing the same. The module is shown in figure 1 with the method in figure 2.

Regarding claim 1, Plessing shows the method of producing in figure 2. The method comprises the steps of mounting the body to be laminated, 1, on a tabular member, 15; carrying the body to be laminated along with the tabular member onto the mounting board, 21 (belt 16 does the carrying); heat-bonding the body to be laminated

by pressing using a vacuum laminator, 17; carrying out the body to be laminated along with the tabular member from the mounting board after moving the body to be laminated from the vacuum laminator (16 carries out); and separating the body to be laminated from the tabular member (separation section 27, see column 6, lines 45-50).

Regarding claims 2 and 3, Plessing discloses the use of release sheets, or separating films between the module and the tabular member (column 6, lines 15-18). It is the position of the examiner that the separating films and tabular member do not have perfectly flat surfaces down to the atomic level and thus the surfaces have some measure of irregularity or an irregular form on the surfaces as required in the claims. As applicant has not defined the specificities of these irregular forms, the reference is deemed meet the claim limitations.

Plessing does not explicitly disclose the instant cooling means that directly cool the diaphragm, nor does Plessing explicitly disclose the vacuum laminator comprising a diaphragm. Regarding claim 4, Plessing does not specifically require a specific mounting board temperature.

Ogawa is cited for teaching a known vacuum lamination device and method. The apparatus includes a heating board, 23, on which the bodies to be laminated are placed, and a diaphragm (Film body 3) provided opposite the heating board. In the method, as shown in Figure 11, when the laminated body is taken out, film body 3 is drawn against upper platen 1, through which cooling fluid is continuously passed in path 7. (Column 12, lines 2-27) This positioning of film 3 upon removal of the laminated

product meets the limitation to directly cooling the diaphragm after the body is carried out.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the device configuration and lamination method of Ogawa within the method of Plessing because Ogawa teaches that laminated products made by his method are stabilized in quality and can be made in a shortened forming cycle. (Column 12, lines 12-14)

Furthermore, it would have been obvious to carry out the lamination procedure of the combination repeatedly to form numerous laminated modules. This is suggested by Plessing in that the carrier plates are sent back to the loading station after the completion of the lamination of a module stack. (Column 6, lines 46-48) The only reason for doing this is to repeat the procedure in order to produce multiple laminated module stacks. Clearly, Plessing intends that numerous modules will be made in the lamination system disclosed (Plural modules disclosed also at Column 7, lines 24-26) Such repeated lamination would clearly entail carrying in another body as claimed.

Regarding claim 4, the choice of specific lamination temperature is dependent on the specific application i.e. the specific lamination system, the item to laminated, and optimization of the lamination process. It would be obvious to one skilled in the art to make such a determination of operating temperature based on the specific application/optimization. Absent any unexpected results, the choice of the specific temperature as within the claim would be obvious for the method taught by the prior art.

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al and Ogawa as applied to claims 1-4 above, and further in view of Yamada et al (U.S. 6,127,622).

Plessing et al and Ogawa are relied upon for the reasons given above in addressing claims 1-4.

Neither Plessing et al nor Ogawa requires a specific organic peroxide crosslinking agent.

Yamada teaches a laminated solar cell module as shown in figure 5. Yamada teaches the use of an encapsulating foam made of EVA for example (column 7, paragraph 4) and a crosslinking agent for the encapsulating foam made of an organic peroxide that has a 1-hour half-life temperature of between 100 and 170 °C (column 8, last paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the crosslinking agent of Yamada within the method of Plessing et al and Ogawa, because the crosslinking agent improves the heat resistance and bond strength of the photovoltaic module (Yamada column 8, paragraph 7). It would have been further obvious to one of ordinary skill in the art at the time the invention was made to choose the specific half-life temperature of the claim because Yamada teaches that the crosslinking agent can have a 1-hour half-life temperature range that includes the claimed range. Absent any unexpected results, the selection of this portion of the range would be obvious for the combination. Because Yamada, Plessing et al, and Ogawa are concerned with solar cell modules, one would have a

reasonable expectation of success from the combination. Thus the combination meets the claim.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al and Ogawa as applied to claims 1-4 above, and further in view of Taylor. (US 4,426,633)

Plessing et al and Ogawa are relied upon for the reasons given above in addressing claims 1-4.

Neither Plessing et al nor Ogawa explicitly teaches a material used for the separating films used to prevent adhesion of the laminated module to the carrier plate.

Taylor is relied upon for teaching known release films used in lamination methods to prevent adhesion of the laminated product to the lamination apparatus. Taylor teaches the use of glass-fiber reinforced PTFE as a release sheet in a lamination process. (Column 6, lines 8-45)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Plessing et al and Ogawa by specifically selecting glass fiber/PTFE release sheets as the separating films (Plessing, Column 6, lines 15-17), as taught by Taylor, because Taylor teaches that glass fiber/PTFE sheets are effective in preventing adhesion of the laminated products to the apparatus. (Column 6, lines 8-45) Because Taylor, Ogawa, and Plessing et al are all concerned with laminating systems and methods, a skilled artisan would have had a reasonable expectation of success from this combination. Furthermore, Plessing's silence

concerning the material used to make the separating films would have led a skilled artisan to turn to related prior art release films, such as those of Taylor, to select an appropriate material. Note also that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Response to Arguments

13. Applicant's arguments filed on 7 August 2009 have been fully considered but they are not persuasive.

Applicant argues that none of the prior art of record teaches the instant limitation to the diaphragm being directly cooled by cooling means after carrying out the body. The Examiner respectfully disagrees. As noted above, the flow of ambient air that enters the vacuum laminators after lamination is considered to correspond to the instant cooling means, which is disclosed as being optionally an "air blow" in the specification. In addition, Ogawa teaches drawing of the laminator diaphragm against a cooling means after lamination. Because it would have been obvious to repeat the lamination procedure multiple times, for the reasons indicated above, all limitations of the instant claims are therefore met.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey T. Barton whose telephone number is (571)272-1307. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrey T. Barton/
Primary Examiner, Art Unit 1795
2 November 2009